geographically deaveraged to allow for differences in costs due to population density and topography. We further agree that a divergence between element prices and regulated access charges creates an artificial incentive to substitute unbundled network elements for access. Such artificial incentives mean that carriers would potentially choose the less efficient alternative or an alternative with high transaction costs to bypass access charges (or to take advantage of regulated unbundled network elements set at artificially low prices). This potential for inefficient bypass is why unbundled network elements should be priced in a manner reflecting economic costs; it is also why access prices should not create opportunities for arbitrage. Finally, it is why additional cost recovery should take place through a system of nonbypassable end-user charges and universal service funds.

24. Efficient access pricing means that prices for origination and termination of communication on the LEC's network should be neither too high nor too low. The efficiency of access pricing is judged in relationship to incentives to use existing facilities and to invest in competing facilities. A price for access that is too high will discourage use of existing facilities and encourage inefficient overinvestment in new facilities. That outcome is the *inefficient bypass* case. Conversely, a price for access that is too low will encourage use of existing facilities and discourage efficient investment in new facilities. That outcome is the *free-riding* case. The problem with inefficient bypass is that total facilities costs rise unnecessarily, whereas the problem with free riding is that overuse and underinvestment induces congestion and network degradation, analogous to what generally occurs under rent control.

25. What is meant by network access? Precision in defining access is useful in determining pricing policies and the cost of providing access. Access to the local exchange network, as defined by John T. Wenders, refers to "the *right* to be connected to the network and make calls at whatever price is charged for usage," where usage denotes outgoing calls only.[7] He further observes that access can include the right to receive calls. In addition to the connection to the network at the time of use, the right

7. JOHN T. WENDERS, THE ECONOMICS OF TELECOMMUNICATIONS: THEORY AND POLICY 46–47 (Ballinger Publishing Co. 1987) (emphasis in original).

of access also includes the *option* to receive calls or to purchase calls at existing prices.[8] Thus, access to the local exchange network includes both a connection and option component. There are costs associated with providing both connections and standby capacity to supply the option to achieve a connection. The costs of standby capacity are capital costs of network capacity that are similar to the merchant's cost of holding inventory to provide "immediacy" to customers. Clearly, pricing of access to the local exchange network depends on the price of usage. Flat-rate pricing effectively sets the price of usage at zero and requires cost to be covered from the price of flat-rate service and the price of access.

26. The services of the local exchange network are an input to various network services. Access to the local exchange network, which includes both connection and option components, is used to obtain services such as interconnection with other networks. Thus, connection to an interexchange carrier for a customer of the local exchange requires access to the local exchange network. It also includes *usage* of the local exchange network, including local loops, switching, transport, and other network services required to reach the IXC's point of presence. In other words, originating the connection to an IXC's point of presence using the local exchange network includes three components: (1) connection to the LEC's network itself; (2) the option value of that connection; and (3) usage of the LEC network to reach the IXC's point of presence. Pricing the connection to the IXC should reflect the costs of these three components. Similarly, terminating connection from the IXC's point of presence to the call recipient includes the same three components. Pricing access for network interconnection must therefore include prices for those three elements.

27. The customer of the LEC originating a long-distance call already pays for access (that is, the right to connect and the option value of the connection). The customer of the LEC should also pay for the usage of the network in connecting to the IXC's point of presence. Conversely, the IXC terminating a call on the local exchange network should be responsible for paying for connection to the

8. *Id.* at 48.

LEC's network itself, for the option value of that connection, and for usage of the LEC network to reach the call recipient.

28. Regulators face a difficult problem in attempting to select efficient prices. Rather than trying to mimic market processes through command-and-control regulation, regulators should rely as much as possible on market forces to set prices. Prices for originating and terminating access should be capped by existing market alternatives. Access prices include both nontraffic-sensitive and traffic-sensitive portions reflecting the costs of transmission between the point of presence and the origination or termination point on the local exchange network. The usage-based component should depend upon such cost-causing factors such as time and distance. To ensure that prices reflect cost causation, it is necessary to eliminate flat rates, geographic rate averaging, and other cross-subsidies in the rate structure. Access prices should cover the incremental cost of providing access (TSLRIC) plus a *market-allowed* contribution to common costs. LECs should be given flexibility in setting access prices.

29. For many of the LEC's customers there are competitive benchmarks for pricing access that serve to lessen or eliminate any monopoly power on the part of incumbent LECs. With competing access alternatives, customers can choose the least-cost alternative. Thus, if the price charged to customers for access to long-distance services by the LEC is too high, the customer has several alternatives. First, the customer can obtain wireless access from a cellular carrier or digital PCS provider. Such access serves to place an upper limit on what can be charged for originating access. That limit obviously can be expected to fall as multiple PCS providers commence service in a given geographic market. Second, for those customers who generate most of the net revenues of the LEC, the price for originating access is bounded by the market prices of competing carriers offering access, including competitive access providers (CAPs) operating fiber optic networks in a large number of city centers. Third, with the passage of the Telecommunications Act of 1996, entrants can provide local access services through resale of the incumbent LEC's local service or through the operation of certain facilities

combined with purchasing the services of the incumbent LEC' unbundled network elements. Regulation of the prices of resale and unbundled network elements continues in force. Interexchange carriers and other entrants can construct virtual networks for the provision of access. The pricing of access thus cannot exceed the cost of self-provisioning of access.

30. On the termination side, much has been made of the "call externality," which denotes the phenomenon that the both parties to a telephone call may obtain benefits to the call but the cost (except in the case of cellular telephony) is paid by only the caller, presumably without additional transfers from the recipient reflecting the benefits received.[9] Such an externality appears to be of little importance; but even if it were significant, there are good reasons to believe that it has been effectively internalized through negotiation between parties making and receiving calls and through other market mechanisms. No regulatory response is needed for, as Stephen Littlechild has observed, not only are public policy makers unlikely to judge the benefits correctly,

> the participants themselves are well able to judge these benefits and to modify not only their own conduct but those of the other person. Specifically, a person can attempt to make collect calls . . . . Friends who call long distance regularly can agree to take turns . . . . I suggest, therefore, that any substantial or repeated externalities can relatively easily be internalized, and that call price reductions for this reason would be a mistake.[10]

The main point is that the cost of a call usually can be internalized within the transaction taking place between the parties making and receiving the call. This characteristic has the important additional implication that price discrimination by a LEC between originating and terminating access would be subject to arbitrage by callers that would eliminate any potential gains from such discrimination. Thus, for example, if a LEC overpriced terminating access relative to originating access, there would be incentives for any pair of callers to alter their pattern of calls to favor the lower-priced alternative so as

---

9. LESTER D. TAYLOR, TELECOMMUNICATIONS DEMAND IN THEORY AND PRACTICE 231–32 (Kluwer Academic Publishers 1994).

10. Stephen C. Littlechild, *The Role of Consumption Externalities in the Pricing of Telephone Service, in* PRICING IN REGULATED INDUSTRIES: THEORY AND APPLICATION 38, 44–45 (John T. Wenders ed., Mountain States Telephone & Telegraph Co. 1977), *quoted in* WENDERS, *supra* note 7, at 30.

to reduce the overall costs of making calls between them.

31. Wireless carriers typically obtain access charges to a customer that is either originating or terminating a call, and furthermore the originating and termination charges are equal to each other. Thus, for wireless carriers competitive considerations limit the price of both origination and termination of calls. Other types of carriers, including the incumbent LECs, generally charge the originating party the cost of termination. Competition mitigates or eliminates the "local bottleneck" not only for origination access, but also for termination access. First, as we have already noted, the call externality can be internalized for repeated calls. Second, the call externality can be easily addressed by companies offering bypass alternatives through an offer of lower prices (for access and IXC service) than the LEC. An incumbent LEC would hold few if any captive customers for termination access because those customers would be served by competing carriers. If the cost of the long-distance service were too high, where the service was a package consisting of LEC provision of access and long-distance service provided by either the LEC or the IXC, then there would be additional incentive for entrants to build competing networks. Buyers would have an incentive to move to a service that was more efficient at both the originating and the terminating end.

32. The incumbent LEC has an incentive to moderate the price of access because it seeks to sell access to IXCs, Internet service providers, resellers, and other customers. The LEC earns returns on providing access to its local exchange network, even if that access is provided to competing IXCs. Customers demand access to the IXCs in response to their service offerings. Because the LEC obtains access revenue on those IXC calls, it would have little incentive to impose cost penalties or degrade the quality of connections simply to "favor" its own services.

33. Because of market competition for access, because of the unbundled network element alternatives provided to entrants under the Telecommunications Act, and because of the incentives for LECs to supply access to the marketplace, the Commission should rely on market forces to adjust the

connection and usage portions of the access charges from their current levels. As we will demonstrate in the next section, neither the Commission's market-based approach nor its prescriptive approach is responsive to market forces. Moreover, as later sections will explain, the Commission should supplement access charges with competitively neutral end-user charges to recover the costs of access.

II. The Commission's Market-Based and Prescriptive Approaches Would Increase Regulation

34. The Commission's competitive triggers have little to do with competition and everything to do with enforcing its version of pricing for resale and unbundled network elements. The competitive triggers prolong and increase regulatory intervention in the telecommunications marketplace. These regulatory controls are not in the public interest because they would delay the benefits of competition and could derail the competitive process.

35. The Commission poses a number of questions about the tests of the competitiveness of local exchange markets to be applied before removing price regulations. The Commission should select tests of competition that are consistent with standard measures of market competition. Therefore, it should take into account measures of actual and potential entry. In this regard, applications for certification of facilities-based and nonfacilities-based competitive local carriers (CLCs) and the approval of such applications by state regulatory commissions should be taken into account and given weight as evidence of actual and potential entry. In addition, the establishment of facilities and the announcement of plans to construct facilities should be given substantial weight. In response to the Commission's questions,[11] measures of market demand responsiveness using demand elasticity measures should be considered. In addition, measures of supply responsiveness (including assessment of potential entry and opportunities for entry suggested by cost and revenue data for incumbent carriers) should also be given due consideration. Market share data is far less important, because the incumbent LEC has a high market share by virtue of past entry controls; its future pricing and service decisions, in contrast, are conditional

11. *Notice* ¶¶ 156–59.

of the economic discipline exercised by the actions of new entrants and potential entrants, which the Commission should give far more weight. Moreover, the entrants run the gamut in terms of transmission technology: fiber optic, coaxial cable, wireless (both cellular and digital PCS), and combinations of these technologies. The entrants include both startup companies, consortia of large companies, and well-established companies such as AT&T, MCI, and Time-Warner.

36. Pricing relative to a price cap should not be used in isolation to assess competition because the cap itself may be originally set too high or too low. Moreover, the best approach to price caps is to remove them as the market is shown to be competitive. If companies are pricing below the cap, that is evidence that the constraint is not binding and that the price cap is superfluous. Pricing below a cap should not lead to ratcheting the cap downward to eliminate pricing flexibility.

37. Paradoxically, the Commission's market-based approach imposes more regulation and less reliance on the market. It has two phases, corresponding to actual and potential competition. In Phase 1, the Commission would remove "the prohibition against geographic deaveraging within a study area; the ban on volume and term discounts for interstate access services; the current prohibition against contract tariffs and individual request for proposals (RFP) responses; and various restraints on the ability of incumbent LECs to offer new, innovative access services."[12] We support the immediate removal of those restrictions.

38. The Commission instead proposes a set of four aptly-named "competitive triggers."[13] The first condition is that unbundled network elements be available at forward-looking economic cost—that is, on the basis of the TELRIC of the network element, plus a reasonable allocation of common

12. *Id.* ¶ 168.
13. *Id.* ¶¶ 170-75.

cost.[14] The second condition is that "transport and termination be available for local traffic at cost-based rates."[15] The third condition is that "an incumbent LEC must offer its retail services to resellers at a wholesale price, which is equal to the retail price minus the reasonably avoidable cost of providing wholesale rather than retail service."[16] The fourth condition is that "incumbent LECs be required to demonstrate that competitors are able actually to order and receive elements and services in a commercially reasonable manner and in necessary quantities."[17] We examine each of these triggers in turn to determine whether it is an appropriate market based criterion, as the Commission suggests.

39. The first condition is a valid criterion only if the "reasonable allocation of common cost" is based on market forces. The availability of unbundled network elements at economic costs will drive the LEC's access charges to efficient levels, as we noted previously. If UNEs are priced incorrectly, however, adverse consequences will follow. If this first competitive trigger is simply a transparent manner of effecting the pricing methodology and proxy values of the *First Report and Order*, then the condition represents an extension of regulation to the pricing of resale and unbundled elements. It is improper to evaluate competition on the basis of compliance with regulatory conditions that have little connection with market constraints.

40. The same objection applies to the second condition. Again, the costs of transport and termination should reflect economic costs and should be allowed to adjust to market conditions. As we demonstrate in the next section, the pricing methodology proposed by the Commission is not valid for either resale, unbundled network elements, or interstate access.

41. The third condition introduces the terminology "avoidable" cost in the context of establishing wholesale discounts, whereas the Telecommunications Act of 1996 specifies that discounts

---

14. *Id.* ¶ 170.
15. *Id.* ¶ 173.
16. *Id.* ¶ 174.
17. *Id.* ¶ 175.

shall be based on "avoided" costs.[18] The discount for resale services should reflect the costs that the LEC actually avoids. Moreover, the wholesale price of services should include the incumbent LEC's costs of making the services available for wholesale. Steeper discounts imposed by regulators would subsidize entrants, invite free riding, and discourage facilities-based competition.

42. The fourth condition appears to be superfluous because incentives already exist for incumbents to obey the provisions of the Telecommunications Act, including the competitive checklist. Furthermore, why is it proper for the Commission to presume that incumbent LECs are violating their preexisting statutory duties and must be required continually to prove their compliance? It would seem more appropriate for the Commission to apply a presumption of compliance. Moreover, ample incentives exist for entrants to monitor the conduct of the incumbent LECs without adding administrative monitoring as a competitive trigger.

43. The Commission proposes another set of triggers for Phase 2 that apply to the incumbent LEC: (1) demonstrated presence of competition; (2) full implementation of competitively neutral universal service support mechanisms; and (3) credible and timely enforcement of procompetitive rules.[19] These criteria seem to be broader and less restrictive in nature than those of Phase 1.

44. Rather than attempting to replicate the market, regulators surely recognize that achieving market outcomes requires removing regulatory restrictions as telecommunications markets become increasingly competitive. Expanding the scope of regulation will only make it less, not more, plausible that regulators will be able to achieve market outcomes.

45. Congress, the states legislatures, and regulators have opened the local exchange market to competition. If they now establish unbiased rules that allow entrants and the incumbent LEC an equal opportunity to compete, regulators can rely on market incentives to produce competitive outcomes. Firms

---

18. 47 U.S.C. § 252(d)(3).
19. *Notice* ¶ 202.

compete when and where they discern opportunities for profit. They compete by investing in facilities to produce goods and services. They compete by making process innovations so that their prices can be lower than competitors'. They compete by undertaking research and development to provide improvements and innovations in existing products and services. They compete by differentiating their product offerings from their rivals'. Competition takes place in markets without the need for government promotion. Rather, it is the spontaneous and natural outcome of private companies seeking to obtain a competitive return on the investment of their shareholders. Competition occurs because of the economic rewards that firms expect to obtain by satisfying the demands of their customers.

46. If regulators are concerned that competition will not be sufficiently vigorous following their removal of entry barriers, then they should rely on price caps and allow competition (if it takes hold) to set prices below the cap. Moreover, the caps should be phased out as rapidly as possible because many factors other than imperfect competition (such as rising input costs, capacity shortages, or product enhancements) can cause market prices to rise. Adjustments to price caps based on productivity and inflation indices are unlikely to achieve the flexibility required for the regulated firm to keep pace with changing market conditions.

47. In accord with the lower entry barriers resulting from the 1996 legislation and state deregulation, the Commission should commit to curtailing its future market intervention. The competitive market is an allocation mechanism that generates and uses tremendous amounts of information about the preferences and purchasing patterns of individual consumers, as well as the technology and supply patterns of many diverse competitors. Competitive markets that are growing and innovative generate quantities of information that are orders of magnitude greater than what any regulatory commission can assimilate. The Commission must be prepared for the increased complexity of competitive markets by withdrawing entirely its supervision and management of the pricing and other strategic decisions made in any market that is demonstrably competitive.

III. THE INEFFICIENCY OF TSLRIC AND TELRIC PRICING WITH ARBITRARY ALLOCATIONS OF COMMON COSTS

48. How shall access be priced? The Commission advocates TSLRIC (or TELRIC) pricing plus a reasonable share of common cost. We could agree with that proposal only if the "reasonable share of common cost" were determined by market forces rather than by administrative fiat. The Commission states at paragraph 221 of the *Notice* in this proceeding:

> An incumbent LEC's TSLRIC for a given service or facility, such as exchange access service, should include all incremental costs directly attributable, or dedicated, to the delivery of the service or facility in question. Carriers also should be allowed to recover a reasonable allocation of their forward-looking common costs, defined as those costs that are incurred in connection with the production of multiple products or services that remain unchanged as the relative proportion of those products or services varies. We note that when calculating the forward-looking economic cost of exchange access services, because these services share common network facilities with other incumbent LEC-provided services, such as local exchange service and intraLATA toll, fewer costs will be directly attributable or dedicated totally to exchange access services. Consequently, the incumbent LEC may need to recover significant common costs in addition to the TSLRIC of exchange access. These common costs should be recovered in a manner that is economically efficient and consistent with the pro-competitive goals of the 1996 Act. By contrast, the TELRIC of a specific facility, such the loop or the switch, would directly attribute to that facility all costs caused by that facility, regardless of the services provided by that facility. Consequently, the forward-looking common costs that the incumbent LEC must recover in addition to the TELRIC of that facility in order to recover forward-looking economic costs are lower than the forward-looking common costs that need to be recovered for a service.[20]

The Commission's discussion asserts that the amount of common costs that should be recovered depends in a systematic way on the measure of incremental cost. This cost-based approach to pricing bears little relation to market-determined pricing. Moreover, when prices are distorted in this manner, it is unlikely that the incumbent will be able to cover its costs because overpriced services will not be purchased and underpriced services will be overused. Prospective entrants into local exchange telephony advocate that the prices for network services be equal to their TSLRIC per unit. Analogously, prospective entrants including the interexchange carriers seeking to purchase unbundled network elements advocated that the prices for those elements be set equal to their TELRIC. To avoid redundancy, and because the economic

---

20. *Id.* ¶ 221.

analysis is the same in either case, we will subsume our critique of TELRIC pricing within that of TSLRIC pricing.

49. To be sure, TSLRIC or TELRIC pricing is simple to understand: It is the per unit attributable cost of a service or network element. It would be a mistake, however, to equate simplicity with accuracy. Although there are conceivably some savings in administrative costs to "getting pricing right," those possible cost savings are trivial compared with the short-term and long-term market distortions that would be certain to result from taking the easy way out. TSLRIC (or TELRIC) pricing is overly simplistic because it is simply the wrong pricing policy.

50. In the access context, the TSLRIC price is the attributable portion of network costs associated with the origination and termination of a call on the local exchange network. The problem with TSLRIC pricing generally is that it does not equal economic costs. That is why TSLRIC pricing creates economic inefficiencies. The problems with TSLRIC pricing outlined below stem from that basic defect. Clearly, all of the problems with TSLRIC pricing are present for prices that are *below* TSLRIC, and can occur as well with arbitrary markups over TSLRIC that do not reflect economic costs. In what follows, our criticisms apply to pricing based on arbitrary allocations of common cost as well as to pricing that includes no common cost, or only partial recovery of common cost.

A. Pricing Should Be Based on Markets, Not on Administrative Allocation of Common Costs

51. The Commission divides costs into incremental cost (TSLRIC or TELRIC) and common costs, and it proposes a definition of "economic cost" that consists of incremental cost plus a share of common cost:

> The first condition we propose is that unbundled network elements be available at forward-looking economic cost, i.e., on the basis of the TELRIC of the network element . . . , plus a reasonable allocation of common cost. Unbundled elements provide a ubiquitous substitute for access service.[21]

The problem, however, is to determine what is a "reasonable allocation of common cost." In the *First*

21. *Id.* at ¶ 169.

Report and Order, the Commission offered two cost-allocation methods by which an incumbent LEC would be allowed to seek to recover forward-looking common costs. The effect of both proposals, however, would be to deny the incumbent LEC any practical ability to recover its nonattributable costs.

52. The first method was a fixed markup: "One reasonable allocation method would be to allocate common costs using a fixed allocator, such as a percentage markup over the directly attributable forward-looking costs."[22] This approach is seductive because of its apparent simplicity, but it is nothing more than a fully distributed cost method. The practical effect of a fixed percentage markup is to subsidize entrants at the expense of the incumbent LEC. If the fixed percentage produced a price exceeding the entrant's stand-alone cost for the element, then the entrant would self-supply that particular network element rather than buy it from the incumbent LEC. If the entrant self-supplied the element, then the incumbent LEC would earn no contribution whatsoever to the recovery of its unattributable forward-looking costs. That prospect is real. There are multiple providers of signaling services. There are competitive commercial providers of switching services—including competitive access providers (CAPs) and the interexchange carriers, which can adapt their long-distance switching facilities to perform local exchange switching. For example, AT&T reportedly intends to use its own switches or those leased from CAPs and, as of October 1996, had signed contracts with six CAPs for such services in over eighty cities.[23]

53. On the other hand, if the fixed percentage produced a price less than what the incumbent LEC otherwise would charge for the element (bearing in mind that the incumbent LEC in no event could price the element above its stand-alone cost), then the entrant would buy the element from the incumbent LEC rather than self-supply it. In that case, the incumbent LEC would have been forced to forgo a significant share of the overall contribution earned for its recovery of forward-looking common costs. The shortfall in contribution would equal the difference between (1) the element's stand-alone cost and

---

22. *First Report and Order* ¶ 696.
23. Catherine Arnst, *AT&T: Will the Bad News Ever End?*, BUS. WK., Oct. 7, 1996, at 122, 128.

(2) the sum of the element's TELRIC and its fixed-percentage markup over TELRIC. That shortfall to the incumbent LEC is a coerced transfer to, and subsidy for, the entrant.

54. The Commission's second method for allocating common costs among unbundled network elements was an example of "reverse Ramsey pricing"[24] because of its tendency to minimize rather than maximize consumer welfare. The Commission stated:

> We conclude that a second reasonable allocation method would allocate only a relatively small share of common costs to certain critical network elements, such as the local loop and collocation, that are most difficult for entrants to replicate promptly (i.e., bottleneck facilities). Allocation of common costs on this basis ensures that the prices of network elements that are least likely to be subject to competition are not artificially inflated by a large allocation of common costs.[25]

Citing Ramsey pricing specifically, the Commission ruled in the *First Report and Order* that "an allocation methodology that relies exclusively on allocating common costs in inverse proportion to the sensitivity of demand for various network elements and services may not be used."[26] Despite the well recognized welfare-maximizing characteristics of Ramsey pricing principles, the Commission believed that an analogous method of allocating forward-looking shared or common costs across network elements would violate the 1996 legislation:

> We conclude that such an allocation could unreasonably limit the extent of entry into local exchange markets by allocating more costs to, and thus raising the prices of, the most critical bottleneck inputs, the demand for which tends to be relatively inelastic. Such an allocation of these costs would undermine the pro-competitive objectives of the 1996 Act.[27]

By imposing this reverse-Ramsey constraint on the incumbent LEC's pricing of unbundled network elements, the Commission condemned the LEC to insolvency. It is a sham for the Commission to have told incumbent LECs that they can recover their forward-looking common costs only by raising the prices of their most price-sensitive network elements above TELRIC. Such a constraint ensures that the

---

24. *See* DAVID E. M. SAPPINGTON & DENNIS L. WEISMAN, DESIGNING INCENTIVE REGULATION FOR THE TELECOMMUNICATIONS INDUSTRY 16 (MIT Press & AEI Press 1996).

25. *First Report and Order* ¶ 696.

26. *Id.* (citing Frank P. Ramsey, *A Contribution to the Theory of Taxation*, 37 ECON. J. 47 (1927)).

27. *Id.*

incumbent LEC will be denied the ability to recover any appreciable amount of its unattributable forward-looking costs. That constraint is tantamount to the Commission ordering every incumbent LEC to write a check to each prospective rival to help pay for its cost of entry into the local market.

55. The Commission's two preferred approaches to determining economic cost—fully distributed cost pricing and reverse Ramsey pricing—create cost measures that are unrelated to economic cost. They create arbitrary allocations of common cost that have little to do with the market value of the products and services provided. Moreover, by overpricing some services and underpricing others, the administrative allocation of common costs effectively forces some prices above and other prices below their economic costs. Competitive firms are able to stay in business when they recover common costs and shared costs through revenues above incremental costs. The market-allowed contribution of individual elements cannot be predicted *a priori*. What *is* certain is that a firm that does not cover its common costs and shared costs will not remain in business for very long.

B. TSLRIC Pricing Does Not Reflect the Incumbent LEC's Economic Costs

56. TSLRIC pricing plus arbitrary shares of common costs is not efficient because it does not reflect the LEC's economic costs, which include the direct incremental cost *plus* the opportunity costs of the facilities to which the incumbent LEC provides access. The TSLRIC pricing method is neither efficient nor compensatory because the incumbent LEC will not be allowed the opportunity to recover its economic costs.

57. The incremental economic costs of inputs must equal the direct costs plus the opportunity costs to the firm of those inputs. The economic costs of providing access—that is, origination and termination of calls—thus are measured in terms of the direct costs and the opportunity costs to the incumbent local exchange carrier of providing those services. Such opportunity costs are the revenues forgone by using scarce network capacity to provide origination and termination of calls. As a benchmark for determining such opportunity costs, it is desirable to use the market price of access established by

competition between facilities-based local exchange companies. Such a market price necessarily reflects the stand-alone costs of competing carriers. If such a market benchmark is not readily available, the unbundling and resale provisions of the Telecommunications Act of 1996 provide an alternative reference point because the price of resold services or the prices of unbundled network elements implicitly provide limits on the price for originating and terminating access. To exclude the firm's opportunity costs in one's definition of costs, as do advocates of TSLRIC pricing, is simply an expedient by which regulators give competitors a free ride. It is not an assertion about economic efficiency.

C. TSLRIC Pricing Should Not Be Confused with Competitive Pricing

58. Some economists and regulators justify TSLRIC pricing by analogizing it to marginal cost pricing.[28] David Kaserman, for example, asserts with respect to local telephony that "with common costs present . . . the long-run competitive equilibrium . . . yields prices equal to marginal cost and a full recovery" of the incumbent LEC's total costs.[29] That justification for TSLRIC pricing rests on a misunderstanding of one the most basic principles of economics. It is true, of course, that when price exceeds the marginal cost of production, there may be additional benefits to consumers from expansion of output to the point where marginal cost equals the price. That condition does not imply, however, that utility regulators should set prices for any and all services at their marginal cost (the cost of producing the last unit) or at average incremental cost (the incremental cost of producing the service divided by the number of units of the service provided). There are several fundamental problems with jumping to that

---

28. DAVID L. KASERMAN, JOHN W. MAYO, MICHAEL A. CREW, NICHOLAS ECONOMIDES, GLENN R. HUBBARD, PAUL R. KLEINDORFER & CARLOS MARTINS-FILHO, LOCAL COMPETITION ISSUES AND THE TELECOMMUNICATIONS ACT OF 1996, at 6 & n.4 (July 15, 1996) (prepared for AT&T Corp.).

29. Testimony of David L. Kaserman, AT&T Communications P-140, sub 51, vol. 2, Tr. 19 (N.C. Util. Comm'n Oct. 24, 1996) [hereinafter *Kaserman North Carolina Testimony*]. Kaserman's support for that proposition is Glenn M. MacDonald & Alan Slivinski, *The Simple Analytics of Competitive Equilibrium with Multiproduct Firms*, 77 AM. ECON. REV. 941 (1987). MacDonald and Slivinski, however, develop a model of a two-product firm in which they assume that "the marginal cost of producing either [product] *rises*, and does so nonnegligibly." *Id.* at 945 (emphasis added). Thus they assume a condition in which the marginal cost curve will intersect a product's average total cost curve at its minimum, such that marginal cost pricing can enable the firm to earn zero economic profit and thus break even. *Id.* at 944. Similarly, Kaserman asserts: "If the TSLRIC . . . [are] increasing, then even in the presence of common cost, even in the presence of large common cost, the TSLRIC prices can be fully compensatory." *Kaserman North Carolina Testimony, supra*, vol. 2, Tr. 31 (citing MacDonald & Slivinski, *supra*). The fallacy in Kaserman's reasoning, and in his reliance on the article by MacDonald and Slivinski, is that an incumbent LEC is uniformly believed to operate over an output range in which marginal cost is *below* average total cost.

conclusion.

59. With marginal cost pricing, costs are not covered in the presence of economies of scale (or, in the case of a multiproduct firm, when there are economies of scale and scope). Economists are familiar with the problem of pricing a bridge that costs $100 to build. The marginal cost of providing the services of the bridge are zero. What should be the price of crossing the bridge?[30] Efficiency considerations alone might suggest pricing at zero. Yet, the bridge then would not be economically viable. One solution would be to finance the bridge using general taxation. That policy, however, would transfer income to users of the bridge from those taxpayers who are not users of the bridge. Whether such a solution is viewed as efficient depends on how one evaluates income transfers in determining the effect on social welfare. Those income transfers have consequences for economic efficiency. Accordingly, it is desirable for users of the bridge to pay for the cost of the bridge.

60. To illustrate further how TSLRIC pricing fails to be a useful solution when there are significant shared costs and common costs, suppose now that the bridge accommodates both passenger cars and pedestrians. Again, the incremental costs of allowing each type of service equal zero. The shared costs and common costs are $100. Advocates of TSLRIC pricing would suggest pricing the bridge at zero for both passenger cars and pedestrians. As before, the bridge would not remain economically viable.

61. The analogy between competitive markets and regulated pricing as a guide to efficient pricing is somewhat strained. Even in the ideal case of "perfect competition" covered in basic economics textbooks one cannot say that competitive firms price at marginal cost. Rather, the "perfectly competitive firm" takes the market price as a given and offers its output for sale at the market price. The firm, in this theoretical ideal case, sets its *output* level such that the firm's marginal cost equals the market price.[31] This is how in equilibrium the marginal cost of the firm equals the market-clearing price. That situation

---

30. J. Dupuit, *On the Measurement of the Utility of Public Works*, in READINGS IN WELFARE ECONOMICS 255 (Kenneth J. Arrow & Tibor Scitovsky eds., Irwin 1969); Harold Hotelling, *The General Welfare in Relation to the Problems of Taxation and of Railway and Utility Rates*, 6 ECONOMETRICA 242 (1938).

31. *E.g.*, PAUL A. SAMUELSON & WILLIAM D. NORDHAUS, ECONOMICS 130 (McGraw-Hill, Inc. 15th ed. 1995).

is different from the problem of a regulator seeking to determine the regulated firm's marginal cost, which will vary depending on the types of services and the volume of services that the firm offers. For regulators to determine what price equals the firm's marginal cost, *at the level of services demanded at that price*, is a fundamentally different and more complex problem. To make that determination, regulators not only would have to predict marginal costs at each level of output over a relevant range, but also would have to make projections of the quantity demanded of those services at the relevant prices so as to determine the equilibrium prices.

62. Finally, when textbooks speak of the marginal cost or incremental cost of the firm, they are referring to the firm's marginal *economic* cost. As any textbook will indicate, economic costs of the firm's inputs refer to the direct cost of purchasing the inputs or the imputed *opportunity cost* of inputs that are not purchased. The firm's costs refer to the costs of the inputs used by the firm, with the cost function of the firm defining the minimum cost of producing output given the firm's technology and cost of inputs.

D. TSLRIC Pricing Promotes Free Riding by Competitors

63. TSLRIC pricing fails to address the problem of selling inputs to competitors. To illustrate these issues clearly, consider a fast-food stand that offers both hot dogs and hamburgers, each of which is cooked on the same grill. The unit incremental cost of cooked hot dogs to the firm is $1, and the unit incremental cost of cooked hamburgers is $2. The total cost of the grill is $100. The fast-food stand charges its customers $1.50 and $2.60 for hot dogs and hamburgers, respectively, allowing the firm to cover its shared costs and common costs.

64. Proponents of TSLRIC pricing would have that fast-food stand sell cooked hot dogs and hamburgers to rival fast-food sellers at $1 and $2, respectively, ignoring the shared costs and common costs of the grill, which is the capital of the fast-food stand. The rivals could then offer the cooked hot dogs and hamburgers to the firm's customers at prices that are equal to or lower than the prices of the

fast-food stand. Without question, this free riding would increase competition for the fast-food stand that owns the grill, so much so that the firm would be driven out of business. But such a pricing solution does not conform with any pricing behavior actually observed in a competitive market, and it cannot be justified on grounds of economic efficiency. The problem is not solved by allocating the cost of capital (in this case, the grill) arbitrarily. Rather, the relative markups for the firm's goods (in this case, hot dogs and hamburgers) depend on demand patterns and competitors' prices. This discussion is particularly important for the pricing of access because the provision of origination and termination shares costs with other network functions.

E. TSLRIC Pricing with Arbitrary Shares of Common Costs Encourages Excessive Demand for Network Access and Thereby Contributes to Network Congestion

65. The pricing of network access at TSLRIC plus an arbitrary share of common cost may produce "the tragedy of the telecommons." We are alluding, of course, to the 1968 article by biologist Garrett Hardin in which he argued that there was no technical solution to the problem of overpopulation.[32] The article, however, is more memorable for presenting a succinct, popular discussion of how the absence of property rights can induce the overconsumption and ultimate ruin of a public resource. Hardin's example was a pasture owned by the public in common. Individually, it would be in the interest of each herdsman to increase the size of his herd grazing on the publicly owned commons, notwithstanding the fact that collectively the overgrazing of the commons would reduce and eventually destroy its value for all herdsmen. Hardin, of course, was not first to recognize the problem of externalities that arise from public ownership. Coase, Alchian, and Demsetz had all explained how the absence of property rights induces the overconsumption of a resource,[33] and the basic insight can be traced to Marshall, Pigou, and other pioneers of economic theory.[34] What Hardin did was to popularize the concept and add

---

32. Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968).

33. Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960); Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. PAPERS & PROC. 347 (1967); Armen A. Alchian & Harold Demsetz, *The Property Rights Paradigm*, 33 J. ECON. HIST. 16 (1973).

34. A.C. PIGOU, THE ECONOMICS OF WELFARE (Macmillan & Co. 4th ed. 1932); ALFRED MARSHALL, PRINCIPLES OF ECONOMICS (Macmillan & Co. 1922).

a philosophical twist. By describing what happens to the commons as a "tragedy," he did not intend the colloquial meaning of the word, but rather the meaning that philosopher Alfred North Whitehead imparted to the word: "The essence of dramatic tragedy is not unhappiness. It resides in the solemnity of the remorseless working of things."[35]

66. When economists speak of network externalities, they usually refer to positive spillovers that arise from higher levels of network access and usage.[36] Network externalities are benefits to society that accrue as the size of a network grows: An individual consumer's demand to use the telephone network increases with the number of other users on the network whom he can call or from whom he can receive calls.[37] But economists have tended to ignore the negative externalities from higher levels of network usage. Nonetheless, negative network externalities relating to congestion plainly arise notwithstanding the conventional view that networks have such expansive economies of scale that capacity is seemingly unlimited. That cheerful view overlooks that the design of local telecommunications networks is predicated on probabilistic estimates of congestion in the use of familiar functions (such as dialtone when one picks up the telephone receiver) that consumers may have come to assume are available

---

35. Hardin, *supra* note 32, at 1244 (quoting ALFRED NORTH WHITEHEAD, SCIENCE AND THE MODERN WORLD 17 (Mentor 1948)).

36. *See* Stanley M. Besen & Joseph Farrell, *Choosing How to Compete: Strategies and Tactics in Standardization*, 8 J. ECON. PERSPECTIVES 117 (1994); Michael L. Katz & Carl Shapiro, *Systems Competition and Network Effects*, 8 J. ECON. PERSPECTIVES 93 (1994); Michael L. Katz & Carl Shapiro, *Product Innovation with Network Externalities*, 40 J. INDUS. ECON. 55 (1992); Joseph Farrell & Carl Shapiro, *Standard Setting in High-Definition Television*, 1992 BROOKINGS PAPERS ON ECON. ACTIVITY: MICRO-ECONOMICS 1; Stanley M. Besen & Garth Saloner, *The Economics of Telecommunications Standards*, *in* CHANGING THE RULES: TECHNOLOGICAL CHANGE, INTERNATIONAL COMPETITION, AND REGULATION IN COMMUNICATIONS 177 (1989); Janusz A. Ordover & Garth Saloner, *Predation, Monopolization, and Antitrust*, *in* 1 HANDBOOK OF INDUSTRIAL ORGANIZATION 537 (Richard C. Schmalensee & Robert D. Willig eds., North-Holland 1989); Michael L. Katz & Carl Shapiro, *Product Compatibility Choice in a Market with Technological Progress*, 38 OXFORD ECON. PAPERS 146 (1986); Michael L. Katz & Carl Shapiro, *Technology Adoption in the Presence of Network Externalities*, 94 J. POL. ECON. 822 (1986); Joseph Farrell & Garth Saloner, *Installed Base and Compatibility: Innovation, Product Preannouncements, and Predation*, 76 AM. ECON. REV. 940 (1986); Joseph Farrell & Garth Saloner, *Standardization, Compatibility, and Innovation*, 16 RAND J. ECON. 70 (1985); Michael L. Katz & Carl Shapiro, *Network Externalities, Competition, and Compatibility*, 75 AM. ECON. REV. 424 (1985).

37. *See, e.g.*, TAYLOR, *supra* note 9, at 9; BRIDGER M. MITCHELL & INGO VOGELSANG, TELECOMMUNICATIONS PRICING: THEORY AND PRACTICE 11 (Cambridge University Press 1991); JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 405 (MIT Press 1988); Jeffrey Rohlfs, *A Theory of Interdependent Demand for Telecommunications Service*, 5 BELL J. ECON. & MGMT. SCI. 16 (1974). Usually, we think of the network externality in telecommunications accruing when another access line or another node (exchange) is added to the network. "When a new node is added, the externality is reflected in the number of calls made between any existing nodes and the new node (not an increase in the calls between existing nodes)." MITCHELL & VOGELSANG, *supra*, at 11.

at all times on an unlimited basis.[38] The view overlooks as well that the consumption of network access and network usage, like the consumption of any normal good, will rise as price falls.[39] The network outage experienced in August 1996 by the Internet access provider America Online[40] may be an imperfect analogy to the congestion externality that may beset the local exchange network in the new era of unbundled access, but it nonetheless provides vivid evidence that congestion externalities can and do occur—even without regulatory intervention that stimulates demand for network access by virtue of having set access prices below the full economic cost to the incumbent network operator of providing unbundled functions to its competitors. By October 1996, Pacific Bell reported that roughly 15 percent of local calls were not being successfully completed in the Silicon Valley area of California because Internet usage there, while still a small fraction of total telephone subscribers, had risen to a level that it was seriously congesting the capacity of the local exchange.[41]

67. The tragedy of the telecommons also implies underinvestment in the maintenance, replacement, and enhancement of the local telecommunications network. If the incumbent LEC, the putative owner of the local network, no longer can recover the costs of investments that it would make on a forward-looking basis—let alone keep any economic rents accruing to such investments—then ALECs become free riders and the incumbent LEC's incentive to make further investment in the local exchange network evaporates.

68. Carried to its logical conclusion, the tragedy of the telecommons implies that the owner of the local network will go broke and the quality of the network will deteriorate. Given the preference

---

38. BELL COMMUNICATIONS RESEARCH, BOC NOTES ON THE LEC NETWORK at 4-24 (Bellcore 1994) (describing blocking probabilities for trunking); 1 BELL COMMUNICATIONS RESEARCH, TELECOMMUNICATIONS TRANSMISSION ENGINEERING: PRINCIPLES 604 (Bellcore 1990) ("[E]xcessively high traffic . . . has its greatest impact on switching system operation. This form of overload causes blocking of calls and a breakdown of service.").

39. Robert Crandall is one of the few economists to recognize the potential for inadequately low prices for network access to stimulate inefficiently high levels of use of the incumbent LEC's network by competitors. *See* Statement of Robert W. Crandall on Interconnection Policies for CMRS (Mar. 4, 1996), *submitted in* Interconnection Between Local Exchange Carriers and Commercial Mobile Radio Service Providers; Equal Access and Interconnection Obligations Pertaining to Commercial Mobile Radio Service Providers, CC Dkt. No 95-185.

40. *Big On-Line Crash Frustrates Businesses*, N.Y. TIMES, Aug. 8, 1996, at A1.

41. James Kim, *Net Use Strains Phone Lines*, USA TODAY, Oct. 30, 1996, at 1A.

of regulators to combine TSLRIC pricing for access and UNEs with a reluctance to impose a new competitively neutral, nonbypassable charge (or the increase in an existing charge of that sort), the incumbent LEC will consistently fail to earn revenues from its local exchange operations that will cover their total forward-looking costs. Having imposed such regulatory policies concerning unbundling, the Commission and the state public utilities commission will not be able to expect *any* private investor to take over operation of the local network in the absence of the payment of an explicit subsidy to cover operating losses. The alternative thus becomes public ownership of the network: The logical culmination of unbundling accompanied by TELRIC pricing and continuing asymmetric regulation of the incumbent LEC is the need for some public entity to buy the network and assume financial responsibility for its operating deficits. Paradoxically, the great experiment with network unbundling and access "reform" following enactment of the Telecommunications Act of 1996 shows indications of producing not deregulation, but subsidized competition and public ownership of private enterprise.

F. TSLRIC Pricing Plus Arbitrary Shares of Common Costs Lacks Dynamic Pricing Flexibility and Creates Incumbent Burdens

69. TSLRIC pricing plus arbitrary shares of common costs lacks dynamic flexibility, for there is no room for price adjustment. Pricing at the lowest possible level is not sustainable in the long run because no company can continue to operate indefinitely without covering its shared costs and common costs.

70. Proponents of TSLRIC pricing argue that because prices in competitive markets tend toward incremental costs, regulators should immediately reduce price to its lowest level. That argument is flawed because it presupposes that a competitive market eliminates all margins over marginal cost. To the contrary, competitive markets determine the size of relative margins on products depending on many factors, including the extent of shared costs and common costs, demand elasticities, product differentiation, transactions costs, and marketing and sales efforts. Moreover, the argument presupposes that regulators can discern competitive price levels more accurately than the market can—a proposition

forcefully rebutted by Hayek and many after him.[42]

71. A system of price caps protects consumers from price increases while allowing competitive price decreases. TSLRIC, however, is inconsistent with price caps. It does not allow prices to be adjusted in response to competition. Regulators should not adopt TSLRIC pricing to pursue a mistaken representation of how markets operate. Instead, regulators should let competition determine the margins on unbundled services. TSLRIC pricing, by automatically eliminating *all* margins, leaves the incumbent LEC no room for competitive price adjustment and thus creates a competitive disadvantage relative to new entrants.

72. The Telecommunications Act of 1996 offers a unprecedented opportunity for further growth of competition in local exchange telecommunications. As a precondition, however, the Act requires additional regulation of prices for resale and UNEs. To achieve the intended benefits of competition, it is essential that regulatory commissions grant incumbent LECs sufficient flexibility to adjust their prices for resale and UNEs to reflect customer demand and market conditions. Regulatory rules for pricing of resale and UNEs should allow the incumbent LECs to recover their economic costs, including the additional costs of following unbundling rules. If prices for resale and UNEs are to be regulated, then price controls should not discriminate against the incumbent LECs by placing them at a competitive disadvantage in the marketplace.

73. Regulatory commissions should allow the incumbent LECs the same flexibility in pricing and defining unbundled services that is available to the competitive local exchange carriers. Regulators should not mandate excessive unbundling of the "components" of demonstrably competitive services, for competitive markets suffice to determine the efficient extent of unbundling.

74. Whether the incumbent LEC is providing services to retail customers or to other

---

42. Friedrich A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519 (1945). For a summation of Hayek's theories on the superiority of markets over state control of production, see FRIEDRICH A. HAYEK, THE FATAL CONCEIT: THE ERRORS OF SOCIALISM (W.W. Bartley, III, ed., Routledge 1988).

telecommunications companies, negotiation and competition should be relied upon as much as possible to price services and to resolve whether particular services should be offered in combination with others or *à la carte*. TSLRIC pricing is an extreme negotiating position taken by competitive local exchange carriers seeking access to network services and elements at prices below economic costs.

75. A regulatory commission should not establish pricing and unbundling restrictions that bias decisions about the type of technology that a carrier may employ to offer local telephony service. The absence of such restrictions should apply equally to the incumbent LEC and alternative local exchange carriers. The pricing of UNEs should be determined by customer choice and competitive interaction between the incumbent LEC, the alternative local exchange carriers, and the many other providers of transmission capacity. TSLRIC pricing can bias technology choice by eliminating the rewards from economies of scope, thereby encouraging separation of network services into components associated with incremental costs.

G. TSLRIC Pricing Is Discriminatory

76. TSLRIC pricing is discriminatory because it creates subsidies for entering competitive local exchange carriers at the expense of the incumbent LECs. As we have demonstrated, TSLRIC pricing does not cover the incumbent LEC's direct economic costs, because it ignores shared costs and common costs. Moreover, TSLRIC pricing creates cross-subsidies because it yields revenues that fail to cover the incremental costs of any *combination* of two or more services that have shared costs. TSLRIC pricing further fails to cover the incumbent LEC's economic costs because it ignores the LEC's opportunity costs when it is compelled to sell inputs to competitors.

77. No competitive firm would agree to pricing below costs. No competitive firm could offer services that subsidize one another, or that contain subsidies for competitors and thus encourage free riding on the firm's facilities. By forcing the incumbent LEC to accept prices to which a competitive firm would never agree, TSLRIC pricing places the LEC at a competitive disadvantage relative to its competi-

tors. Facilities-based competitors certainly will not be subject to such pricing regulations. The discriminatory impact on the incumbent LEC of TSLRIC pricing is undeniable.

H. Summary

78. The supposed efficiency of TSLRIC pricing and TELRIC pricing with administratively determined shares of common costs is a mirage. Such pricing would not in its application cover the firm's total direct costs, nor would it compensate the firm for its economic costs inclusive of opportunity costs. Competitive pricing does not emulate TSLRIC or TELRIC pricing or fully distributed cost pricing approaches. To the contrary, such pricing would invite free riding and would subsidize entrants, both conditions that competitive markets do not willingly tolerate. The imposition of TSLRIC or TELRIC pricing would create the perverse incentive for the incumbent LEC to reduce its common costs and shared costs. That action would be the direct response to the tendency of such pricing to shift attributable costs to shared costs and common costs, and to increase the incumbent LEC's shared costs and common costs as a result of unbundling. In addition to those failings, TSLRIC or TELRIC pricing does not permit the incumbent LEC to have dynamic pricing flexibility. Such pricing discriminates in favor of entrants and against the incumbent LEC. In short, the call to apply TSLRIC or TELRIC pricing to interstate access (as well as to resale and unbundled network elements) is a mantra that misapprehends the most basic principles of price theory.

IV. The Regulatory Contract and The Economic and Legal Case for Full Cost Recovery

79. In this section we show that the regulatory contract is an enforceable legal relationship, not a mere metaphor. Substantial historical evidence substantiates the existence of a regulatory contract, and compelling economic arguments confirm the need for such a contract between the local exchange carrier and the state. Next we examine the key elements of the regulatory contract. Given the existence of the contract, the state cannot credibly assert that it owes no remedy to an local exchange carrier when